AMERICAN SOCIETY OF CIVIL ENGINEERS FOUNDED 1852

PROCEEDINGS of the American Society of Civil Engineers

2 PARTS — PART 2

Vol. LIII — APRIL, 1927 — No. 4

Hydraulic Hokum

FROM remote times have come down evidences that many principles of hydraulics were known to the shrewd priests of heathen deities and made use of by them to delude the simple peoples of their day.

Egyptian history accounts thus for the origin and peculiar form of the Canopus vessel and affords a fair specimen of priestly power that may more truly be called Hydraulic Hokum.

Taking an earthenware jar, one of these priests, probably more learned than spiritual, drilled a number of holes in the sides and bottom. These he covered with wax, disguised with paint, and filled the jar with water. Upon the device he placed the head of an image and presenting it as the god Canopus, challenged the Chaldean deity Fire to a trial. The result justified his faith (or laboratory experiments) for the wax melted and the liberated water extinguished the flames.

Similarly, Roman history affords an incident, mentioned by Valerius Maximus, Pliny, and Livy, wherein again a simple hydraulic principle was made to assume a divine significance. The vestal, Tutia, in order to establish her innocence when accused of breaking a vow, invoked the Goddess Vesta to aid her by a miracle, and succeeded in carrying a sieve full of water from the River Tiber to the temple of the deity, thus not only saving her life, but greatly increasing her reputation for sanctity.

As there can be no doubt that this occurrence actually took place, incorporated as it is with Roman art and history, the means used were either natural or supernatural. Some writers, including St. Augustine, admitted this miracle as genuine, but there are circumstances sufficient to show it to have been a well-conceived and neatly-executed trick, on the part of Tutia and her friends, and actually simpler than many to which the heathen priests resorted.

The fact that Tutia selected the test and her choice of water instead of fire, the symbol of the invoked deity, at once throws suspicion on the incident.

The contrivance was presumably a modification of the ancient sprinkling pot just described. The sieve she used would be a double one, *i.e.*, with hollow bottom and sides, the exterior bottom only being perforated, the inner one capable of holding water, and the upper edges of both united and made air-tight, with

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Contributions

IT is to be counted most fortunate that recently there have been made available for printing in Proceedings several contributions.

Mr. Nevius contributed his letter in regard to expert testimony; Mr. Spofford, Director of the Society from District No. 2, prepared the article on "The Brotherhood of Bridge Builders"; and Mr. Burmister, a civil engineering student at Columbia—where, by the way, there is no Student Chapter of the Society—furnished the article on Tau Beta Pi.

These all appeared in the March issue in which also was an abstract from a letter forwarded by a member with the thought that it might be of interest.

In this, the April issue, also there will be found a contribution by the wife of one of the Society's members.

To quite an extent, therefore, it appears that this sheet is taking on an attitude of not so much *for* the members as *by* the members.

"Asheville in April"

DETAILS of the Quarterly Meeting to be held in Asheville, April 20, 21 and 22, are now available in the form of the usual printed circular, some of the pictures in which give a suggestion of what may be expected in the way of scenery.

The technical program is attractive and should invite considerable interest, but perhaps one thinks of the mountains of North Carolina in spring in terms other than, or at least supplementary to, engineering technicalities. At any rate it is the intention of the local members to provide opportunities for those who have a desire for recreation to indulge themselves.

The meeting will be held the week following Easter which this year falls on April 17. A preliminary session of the Board may be held on that day, the regular sessions to be on Monday and Tuesday. Wednesday, as usual, is the first session of the Society meeting and as a departure from usual practice, in view of the lure of the open, there will be no sessions in the afternoons, with the exception of the meeting for the members of the Student Chapters in attendance.

Motor rides, or golf on either of the two famous links, the Biltmore Forest Country Club or the Asheville Country Club, have been provided for, and there is always the possibility of an early morning canter over the bridle paths if one can only get up early enough after an evening of dancing.

Inquiry of the State Highway Commission at Richmond, Virginia, will certainly elicit, for those desiring to motor from the north, information as to the more direct, hard-surfaced roads.

Play and the Engineer

By Merren G. Morton

IN all other professions, except the Engineering Profession, the human contacts, the intimate intercourse of social life in play time has been emphasized. Doctors, lawyers, teachers, merchants, bankers, cultivate and capitalize their associations along these lines.

It may be unethical for them flauntingly to advertise themselves or their professions, but it is entirely permissible and subtly advisable to encourage human contacts by recreational associations. It is one of the most delicate forms of successful advertising by applying a fundamental principle of life.

We are living in a busy age to-day, a more emotional age, an age demanding recreation, a renewal of energies. Scientists, teachers, physicians are recognizing this fact. In the stress of concentrated efforts and complicated living, we must have recreation, or in its interpreted sense, we must be *re*-created. To keep abreast of the times, to gain the recognition socially and economically that he deserves, the engineer, too, must incorporate in his plans this fundamental principle of life. He must learn to play. His mental attitude must include this element of play. He must think of play as a necessity rather than a waste of time. He must so arrange his hours of concentration and labor that some form of play, persistently pursued, can become a habit with him. He must enlarge his contacts of diversion with his fellow man, remembering that he, as much as youth, needs the rebuilding and stimulating that supervised play involves, and that he needs the enlarged human contacts that the spontaneity of play develops.

Play, a fundamental principle of life, restores damaged tissue, renews energies and inspirations, enlarges viewpoints. Play, a fundamental principle of life, reaches into the humanizing contacts and makes possible a closer personal relationship, a greater character development, a richer value of life.

So, in its relation to the engineer, play, a fundamental principle of life, must be included in the plan for development of greater physical strength, greater moral tone, greater economic recognition and success.

The above is an extract from the address given before the Sacramento Section of the Society by Mrs. Morton, wife of R. M. Morton, member of that Section. It is a matter of regret that space does not permit the reproduction of the entire address.

April Proceedings

UNDER the title "Automobile Hazard in Cities and its Reduction," William J. Cox, Junior, addresses himself to a most timely issue. Noting that the dangers of automobiling are in proportion neither to the size of the city nor to the number of cars, he has attempted to find a better explanation. His intensive study leads him to the conclusion that this hazard varies as the fraction, population over street mileage. Statistics from most of the large cities substantiate these findings whereas deviations from the rule are found to be attributable to special conditions, such as strict regulation as a benefit, and slum conditions or poor city planning as a detriment.

To those who had experience in the A. E. F., the paper by Paul M. LaBach, Member, "Water Supply for Army Railways in France," will bring back recollections of especial interest. Mr. LaBach's paper tells of the natural conditions affecting this problem—climate, topography, etc.—the military organizations built up, and the difficulties encountered in expanding the original railway water systems to accommodate the tremendous needs of the American troops. Mr. LaBach adds suggestions aimed to accomplish still better the purposes of such engineering works in a similar emergency.

In his paper "Probability of Flood Flows," F. G. Switzer, Associate Member, attempts to apply the method of frequency curves to flood data. Thereby he finds the probability of floods and also the relation between floods and drainage areas for floods of equal probability. This paper is another indication of the interest of engineers in the problems of probabilities and of floods, both of which have received considerable attention in Society publications during recent years.

The usual plentiful number of discussions are found in April Proceedings. These number 38 discussions on 15 topics. Also the memoirs of 10 deceased members are included.

Student Bulletins

BEGINNING with the issue of the week of March 11th, the Employment Service Bulletin of Positions Open was mailed members of the graduating classes in the Society's Student Chapters, about 1300 in number.

This service to students was inaugurated last year. The names of the members are learned through the co-operation of the Secretaries of the Chapters or the Faculty Sponsors, and each copy of the Bulletin is personally addressed. They are not mailed separately, however, but are forwarded in bulk to some person designated at each engineering school and by him are placed in distribution to the individual members.

Each position open, the details of which are communicated to an applicant only upon inquiry of the Employment Service, is designated by a code number. Members of the Society desiring to employ young graduates will do well to remember this opportunity for getting in touch with these young men and to make their requirements known to the Service.

From 10 to 14 copies of the Bulletin will be sent to each Senior, dependent upon the dates in May or June on which the school closes.

"Heroes"

UNDER the above heading there appears in the February 28th issue of "Time," an article about Mr. Stevens and his unheralded recent visit to the Panama Canal. The following is the opening paragraph:

"A train chuffed southeastward, from the Caribbean shore toward the Pacific. In it, crossing the Isthmus of Panama, sat a quiet, erect gentleman of 73. No one had paid much attention to him when he left his ship at Cristobal, but along the railway, at various stops, men who had worked 20 years or more in the Canal Zone, looked at him intently, approached, looked again to make sure, and then said, with great respect, 'Mr. Stevens, isn't it?' Or, 'I don't s'pose you remember me, Mr. Stevens, but I'm . . .' One of the old-timers went to the telephone and rang up Balboa. When his train reached Balboa, John F. Stevens, onetime chief engineer of the Panama Canal, was welcomed at the station by Colonel Meriweather Walker, Governor of the Canal Zone."

The article is accompanied by a photograph of Mr. Stevens as he stood, wearing the several honorary insignia, of which he is the recipient, at the time of the presentation to him of the John Fritz Medal.

Another "Test to Destruction"

AN undertaking that should be both extremely valuable and fascinatingly interesting is to be undertaken by the North Carolina State Highway Commission and the U. S. Bureau of Public Roads.

Briefly, it is as follows, as outlined in a letter inviting the Society to appoint a representative on the proposed Advisory Committee:

"In 1922 there was constructed in the State of North Carolina, as a Federal-aid project, a reinforced concrete highway bridge over the Yadkin River between Albemarle and Mt. Gilead. This bridge is composed of three open-spandrel arch spans of about 150 feet each and fourteen T-beam or deck girder spans of about 40 feet each.

"There is now under construction, a few miles below the bridge site, a dam which, when completed, will submerge the existing bridge structure, necessitating its abandonment and the construction of a new bridge in another location to replace it.

"The period during which the loading tests may be carried on will be limited to the interval between the time when it will be possible to close the bridge to traffic and the time when the bridge will be submerged by the water impounded by the dam.

"This situation provides an unusual opportunity for an investigation of stress distribution in a full size structure and, eventually, for its complete destruction. Arrangements have been made by the same agencies who were responsible for the construction of the bridge, namely, the North Carolina State Highway Commission and the U. S. Bureau of Public Roads, to conduct such an investigation on a co-operative basis.

"The investigation may be made to yield results of great value to the engineering profession and for this reason it will undoubtedly be of considerable interest to a number of engineering and technical organizations. Moreover, the advantage of securing the active co-operation of these organizations in the prosecution of the undertaking is realized. For these reasons it is proposed to organize an Advisory Committee, made up of representatives of the interested organizations, to take charge of the technical direction of the work. We believe that the results which will be secured will constitute such a definite contribution to science as to justify the participation of these organizations.

"We extend to the American Society of Civil Engineers a cordial invitation to appoint a representative on this Committee."

Professor Clyde T. Morris, Chairman of the Society's Special Committee on Concrete and Reinforced Concrete Arches, has been designated the Society's representative.

Outgoing Mail

AT Society Headquarters, four persons are engaged primarily all the time in the handling of outgoing mail.

Not all mail is forwarded from the Society's office, however. Transactions, Proceedings, and the Year Book, are shipped from the binder's, the containers being addressed in the office and forwarded to him for insertion and mailing.

Practically all the other matter is folded, inserted, stamped and mailed directly from the office. The total is large—nearly one half million pieces of mail a year, or an average of nearly 1800 separate pieces of mail each working day.

Like other things treated "en masse", the periodic mail, so to speak, like Proceedings which go out on the last day of each month, or the Year Book, 12,000 copies and more, of which go at one time, requires less handling than the odds and ends, if they may be called that, and this work is all done in the office.

A new, very delicate scale, purchased last year, promptly earned its cost. Last year's Transactions, with its 1800 pages, was seriously near the 4-lb. limit. In fact, the Post Office Department insisted that it exceeded the allowable limit and that a further considerable sum was due for postage. Ordinary mail-weighing scales were too inert to prove the point one way or the other, but when a considerable number of volumes were submitted to trial on the new and expensive apparatus, it was demonstrated to the satisfaction of all concerned that only 14% could be fairly counted as over the dividing line, and the saving on that occasion more than paid the cost of the more expensive scale.

The Engineers Club New York

INQUIRY has been made as to the relation of The Engineers Club of New York to the Society.

As a matter of administration it has none whatsoever; as a matter of geography—the two are adjacent and physically connected.

The Engineers Club is a social organization limited to 2,400 members, of which the resident members are limited to 1,500. Annual dues of the resident members are $100 and of the non-resident members, $62.50. The Club's Constitution states that "it shall be composed of engineers and others who may be interested in or connected with the engineering profession."

Many members of all the National Engineering Societies are members, in fact, naturally make up the very large proportion of its membership, but there is no administrative connection. Mr. Paul Brown, formerly a Director of the Society, is President of the Club, and other members of the Society hold positions as officers or are serving on the Club's several committees, but not as representatives of the Society.

On the ground floor of the Engineering Societies Building, at a back corner, is a door opening into a covered driveway through which, with a walk of perhaps 25 feet, one may enter the Club by a similar door in the corridor leading to the grill, and it is at the luncheon hour that it is principally so used.

In 1904 when Mr. Andrew Carnegie made his gift of $1,050,000 to the Engineering Societies to provide the nucelus for a joint home, he also gave $450,000 to the Engineers Club as a similar nucleus for its club house.

The Club's property now consists of a 106 foot frontage on 40th Street overlooking the Public Library and Bryant Park, the depth being half the block, and a 25 foot frontage on 39th Street, also half a block in depth and immediately to the east of the Engineering Societies Building. On this portion of its property the structure is 5 stories high and by an agreement may not be any higher, thus affording to the Societies' building assurance of light and air on that exposure.

Miscellany

The Portland (Ore.) Section has adopted a plan, new to most Sections, it is believed, of having a "reporter" for the Section, his duties being, it is understood, to keep the press informed as to the activities of the Section.

O. E. Stanley, Member, is the official reporter.

The old Scotch saying, "Many a mickle makes a muckle," seems particularly true of paper.

We get so used to newspapers of from 12 to 52 pages that we fail to realize the immensity of the aggregate space presented as in square inches or in square feet.

The order recently placed for the paper for Proceedings and Transactions has suggested this study in relative values. Each year there are nearly 60 million pages in the two publications, and thin as the paper is, it weighs approximately 60 tons and requires 3 box cars for its shipment.

What's your guess? Suppose a band of iron fitted snugly around the earth at the equator and therefore, say, 25,000 miles or 132,000,000 feet in length, to be increased in length by the insertion of 3 feet. How much will it be lifted off the surface?

This is a question pre-eminently for engineers. No paper and pencil allowed at first. Formulate in your mind the approximate answer and then "check up" on yourself.

The Local Section at Kansas City, joining with the Engineers Club of that city, has inaugurated what is announced as "a serious effort at community singing."

At the first gathering for this purpose Miss Claudine Lucas, who so delightfully entertained the members of the Society on the occasion of the Quarterly Meeting in Kansas City last April, was the artist.

Miss Lucas' ability and charm are so marked that her presence at this meeting of serious-minded engineers trying to sing must have been something like the story told of the little boy who was disappointed at the size of the eggs his bantam hens were laying. One day at his grandfather's he discovered an ostrich egg and, feeling that that was something like, he borrowed it, hung it up in his bantam hen house, and attached a sign which read: "Look at this and do your best."

Professional Records

REMARKS in these columns last month regarding the making out and forwarding to headquarters of the professional records were largely with respect to their value in connection with the Employment Service, but that, after all, is only a portion of their merit. For instance, such cases as the following have arisen:

Two arbiters were to pick a third and, prior to his appointment, wishing detailed information, made inquiry of the Society. Reference to his professional record established the point in question and secured his appointment.

Inquiries have also been made in regard to consulting engineers being considered for important engagements by responsible parties quite outside the Society, who recognized it as a logical depository of professional information relative to its members.

Prominent members, upon being asked to suggest some engineer resident in such-and-such a place for a particular type of work, have recalled some friend whose detailed experience, however, has slipped their memory in certain particulars, and these have looked to the Society for information.

Why, after all, should not the Society's records of its members be the very best "Who's Who in Civil Engineering" for all those who are proud of their work?

Tutia carrying water in a sieve

Hydraulic Hokum

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the exception of one or two small openings on the edge. Thus, when the sieve was pressed slowly under water, the liquid would enter through the perforated bottom, drive the air before it and fill the cavity; and when the upper part was sunk below the surface, the upper or apparent sieve would also be filled.

With such an arrangement, by covering the small opening with the thumb, the vessel might be raised from the river, the water in the cavity being suspended, so that Tutia might return with it to the temple where imperceptibly sliding her thumb to one side, the air would enter and the contents of the cavity would descend in a shower to the amazement of the spectators, who would not be able to detect the slightest imposition. Later, the sieve would be secured by her accomplices and one of similar appearance held ready for examination.

Of all the implements connected with Hydromancy, cups are the most interesting, divination by water having prevailed from time immemorial.

Among these were the ancient divining cups of the Assyrians and Chaldeans. These were filled with water, and a piece of silver or a jewel having certain characters engraved on it was thrown in; the conjurer then uttered some words of adjuration, and the spirit thus addressed, "whistled the answer from the bottom of the cup." These vessels were probably so contrived, that the water might compress air concealed in some cavity in the base, and force it through the orifice of a minute reed or whistle, as in the musical bottles of Peru.

The emerald cup used by the priests of Mentz belongs to this class. On certain days two or three extremely minute fishes were secretly put in and by their motions in the water produced such an effect that the people were persuaded "the cup was alive."

Another example is Tantalus' cup, a magic goblet, with hollow base and containing a hidden siphon, the long leg of which passes into the bottom of the vessel, the short one remaining above; so that when the liquid rises over the bend, it will be discharged by the siphon into the cavity below.

Devices of this kind were sometimes enclosed within the immersed figure of a man (the water, entering at one foot slightly raised, passing out through the other), and the liquid instead of entering the mouth, rising only to the chin, and then flowing away. It is not unlikely that it was through the medium of some such trick that there originated the classic fable, which represents Tantalus suffering the tortures of thirst in the midst of water that reached to his lips, but which, on his attempting to taste, sunk below his reach; hence our word "tantalize."